# UPPER SUBSTRATE FOR TOUCH SCREEN PANEL, METHOD OF MANUFACTURING THE SAME AND DISPLAY DEVICE HAVING THE SAME

This application claims priority to Korean Patent Application No. 2008-1618, filed on Jan. 7, 2008, and all the benefits accruing therefrom under 35 U.S.C. §119, the contents of which in its entirety are herein incorporated by reference.

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an upper substrate of a display device, a method of manufacturing the upper substrate and a display device having the upper substrate. More particularly, the present invention relates to an upper substrate for a touch screen panel, a method of manufacturing the upper substrate and a display device having the touch screen panel.

2. Description of the Related Art

Generally, a flat panel display device has various desirable characteristics such as thin thickness, light weight, low driving voltage, low power consumption, etc., which make it especially suitable for use in various fields.

Currently, the flat panel display device may include a touch screen panel to display an image and to receive information from a user. In order to input the information into the flat panel display device, pressure is applied onto the touch screen panel by a finger, a pen, etc., and a location where the pressure is applied is detected. The touch screen panel includes two substrates and a plurality of sensors interposed between the substrates in order to detect the location where pressure is applied.

However, when the thickness of the flat panel display device is decreased, the flat panel display device may be easily bent by the pressure applied to the touch screen panel. Also, when the screen size of the flat panel display device is increased, a central portion of the flat panel display device may be bent toward a lower direction by sagging due to a gravitational force. When the bending is increased, malfunction of the sensors may be increased.

## BRIEF SUMMARY OF THE INVENTION

The present invention provides an upper substrate for a touch screen panel, a method of manufacturing the above-mentioned upper substrate and a display device having the above-mentioned touch screen panel.

An exemplary embodiment of an upper substrate for a touch screen panel in accordance with the present invention includes; an upper base substrate, a plurality of conductive spacers disposed on the upper base substrate, and a height of the conductive spacers substantially adjacent to a center of the upper base substrate being smaller than a height of the conductive spacers substantially adjacent to a periphery of the upper base substrate, a common electrode disposed on the upper base substrate, and a plurality of supporting spacers disposed between the conductive spacers on the common electrode, and have a height greater than the height of the conductive spacers.

Another exemplary embodiment of an upper substrate for a touch screen panel in accordance with the present invention includes; an upper base substrate, a plurality of conductive spacers which protrude from the upper base substrate, a common electrode disposed on the upper base substrate, and a plurality of supporting spacers disposed between the conductive spacers on the common electrode, and have a greater height than the conductive spacers, a distance between adjacent conductive spacers substantially adjacent to a center of the upper base substrate being smaller than a distance between adjacent conductive spacers substantially adjacent to a periphery of the upper base substrate.



An exemplary embodiment of a method of manufacturing an upper substrate for a touch screen panel in accordance with the present invention includes; disposing a plurality of protrusions on an upper base substrate, a height of the protrusions substantially adjacent to a center of the upper base substrate being smaller than a height of the protrusions substantially adjacent to a periphery of the upper base substrate, depositing a transparent conductive material on the upper base substrate having the protrusions to form a common electrode covering the upper base substrate and a conductive layer covering the protrusions, and disposing a plurality of supporting spacers between the conductive spacers on the common electrode, the supporting spacers having a greater height than the conductive spacers.

Another exemplary embodiment of a display device in accordance with the present invention includes; an upper substrate including; an upper base substrate, a plurality of conductive spacers disposed on the upper base substrate, a height of the conductive spacers substantially adjacent to a center of the upper base substrate being smaller than a height of the conductive spacers substantially adjacent to a periphery of the upper base substrate, a common electrode disposed on the upper base substrate, and a plurality of supporting spacers disposed between the conductive spacers on the common electrode, the supporting spacers having a greater height than the conductive spacers, a lower substrate facing the upper substrate, the lower substrate including; a lower base substrate, a plurality of pixel electrodes disposed on the lower base substrate substantially opposite to the common electrode, and a plurality of TFTs disposed on the lower base substrate, the TFTs being electrically connected to the pixel electrodes, and a liquid crystal layer interposed between the upper substrate and the lower substrate.

According to an upper substrate, a method of manufacturing the upper substrate and a display device having the upper substrate of the present invention, the difference between the bending amounts of the upper and lower substrates is compensated, to improve uniformity of touching sensitivity, and to decrease malfunction of sensors that sense an externally provided pressure.

## BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features and advantages of the present invention will become more apparent by describing in detail example embodiments thereof with reference to the accompanying drawings, in which:

FIG. **1** is a cross-sectional view illustrating an exemplary embodiment of a display device in accordance with the present invention before the display device sags due to a gravitational force;

FIG. **2** is a cross-sectional view illustrating the exemplary embodiment of a display device of FIG. **1** after the exemplary embodiment of a display device sags due to the gravitational force;

FIG. **3** is a cross-sectional view illustrating the exemplary embodiment of a display device of FIG. **2** after the exemplary embodiment of a display device is pressed by a finger;

FIG. **4** is an enlarged cross-sectional view illustrating a portion 'A' of the exemplary embodiment of a display device of FIG. **3**;